

In-plane Separations and High Momentum Structure in $d(e,e'p)n$

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This experiment will study the fundamental nucleus, ^2H . Using the capabilities of CEBAF we plan to considerably extend the present knowledge of the basic $d(e,e'p)n$ reaction by studying the momentum distribution at higher momentum transfers and by undertaking separations of the R_L , R_T and R_{LT} response functions. The Q^2 dependence of the reaction will be examined by performing longitudinal/transverse (L/T) separations for protons emitted along \vec{q} at $Q^2=0.23, 0.81, 2.14$ and $3.41 \text{ GeV}^2/c^2$ at quasifree kinematics ($p_r = 0$). In addition, by detecting protons away from the direction of \vec{q} , the angular distribution of emerging protons will be measured for recoil momenta up to $0.5 \text{ GeV}/c$ at a single 3-momentum transfer of $1.0 \text{ GeV}/c$. From in-plane measurements on either side of \vec{q} plus a backward angle measurement the R_T , R_{LT} and $R_L + R_{TT}$ components can be determined. This should provide additional checks on the model dependence of the reaction. We believe a study of the recoil momentum distribution will form an experimental basis for the study and interpretation of more exotic components of the reaction mechanism of this fundamental 2-body system.

This experiment is based on a previously submitted CEBAF Hall A proposal: PR-89-026.

Status of Previous Proposal: "Deferral until initial experiments in Hall A have allowed the capabilities of the system to be refined."

Date	Description	Beam Hours	Energies	Max. Luminosity
Apr. 5, 1993	$^2\text{H}(e,e'p)n$	679	0.4–4.0 GeV	$1.5 \times 10^{38} \text{ cm}^{-2} \text{ sec}^{-1}$